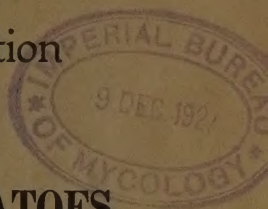


Georgia Experiment Station

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BED ROT OF SWEET POTATOES

By

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Bedded sweet potato partly decayed by the soil fungus,

Sclerotium rolfsii.

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Throughout the upper Coastal Plain section of Georgia, the principal area in which sweet potato plants are grown and shipped, a rot of bedded sweet potatoes, due to the fungus *Sclerotium rolfsii* Sacc., causes serious losses. It is especially bad during seasons of high temperatures in April and May. In some instances every potato is decayed and all plants killed over large areas of the bed. In others the roots of the young plants are badly decayed and a large percentage of the plants show decayed lesions on the stem just below the surface of the soil. Such plants may live and overcome the disease if transplanted, but they are not accepted for interstate shipments and must be thrown out.

When these lesions are small they are frequently confused with the lesions of the black rot (*Ceratostomella fimbriata* Elliott). With a little experience, however, they may be distinguished readily by their pale brown color in contrast with the black or dark brown color of the black rot lesions.

The results of a single experiment indicate that a plant whose root system is partly decayed by *S. rolfsii* may be set in the field without fear of further development of the disease. One June 2, 1921, 300 plants with roots more or less destroyed by this fungus were obtained from Valdosta, Georgia, and set in a field plat at Experiment. Two rows were set entirely with diseased plants, two rows with diseased and healthy plants alternated, and two rows with healthy plants. In spite of the fact that many of the diseased plants had no roots remaining, a fairly good stand was obtained and the plants grew off normally. The potatoes were dug October 21st and carefully examined for rot, but no sign of the fungus was found at this time. Not only had the disease failed to spread to the adjacent plants but the partly decayed slips had developed clean, vigorous root systems. Apparently, sweet

potato plants are very resistant to infection by the fungus after the stems become heavily cutinized.

Although these results indicate that there is little danger of injury to sweet potatoes in the field where plants from infected beds are used, the heavy losses from decay in the beds justify efforts to discover preventative measures of practical application.

Previous laboratory study of the fungus had shown that it would not grow in an alkaline soil. Therefore, application of lime to the bedding soil was at once suggested as a possible method of preventing rot of the bedded potatoes.

During the past five years a number of experiments have been conducted each spring to test the value of lime in the bedding soil, both in controlling the rot and in its effect on the sprouting of the potatoes. Field tests have been conducted at Experiment, Pavo and Tifton; and the results checked each year by similar applications of lime to soil in pots under better controlled conditions in the greenhouse. Commercial hydrated lime was applied at rates varying from 1 to 8 tons per acre. In the early experiments 4 tons per acre was the maximum amount; but it was soon found that an application of 4 tons was not sufficient to make most of our soils alkaline and keep them so for more than a few weeks.

At Pavo, the plats were placed in a field prepared and heavily fertilized for growing pepper plants. Along with other fertilizers it had received an application of cotton seed meal at the rate of 1200 pounds per acre. The lime was applied at rates of 1, 2, 3, and 4 tons per acre and thoroughly mixed with the soil. Sweet potatoes were then bedded and each plat inoculated with *S. rottsii*. The limed plats produced more plants than the check (no lime) plats, but on June 8th bed rot was developing in every plat. Samples of soil from each plat were brought to the laboratory and the reaction determined. None of the samples were alkaline in reaction.

At the same time a similar series of applications were made to a well rotted compost-soil mixture in pots. The reaction was tested at the beginning of the experiment

and again three months later. The pots of soil plus lime at the rate of 4 tons per acre remained alkaline throughout this period, sufficiently so to prevent growth of the fungus. Apparently, the decay of so much cotton seed meal by soil organisms had released sufficient acid to neutralize the lime in the Pavo experiment.

This conclusion is supported by the results obtained in other experiments. It seems unwise, therefore, to apply cotton seed meal or other organic fertilizers to sweet potato beds where this bed rot is prevalent.

Since then, heavier applications of lime have been tried with more uniform success. Applications of 6 to 8 tons of hydrated lime per acre have given increased yields of sprouts and no bed rot has developed. The lime does not appear to affect either favorably or unfavorably the development of black rot.

The results of two series of tests run in 1927 indicate that it does not interfere with the action of the disinfectants as ordinarily applied for the control of black rot.

Bed rot does not cause any serious loss in the Piedmont section of Georgia because the temperatures during April and May are too low to favor growth of the casual fungus. Therefore, no precautions against the disease are necessary in this section. Throughout the Coastal Plain section the temperatures are usually high enough during these two months to allow vigorous growth of the fungus and consequent loss of bedded potatoes.

In this region the application of lime to the bedding soil is recommended. The lime (ordinary builders' hydrated lime) should be spread evenly over the soil at the rate of 6 to 8 tons per acre and thoroughly mixed with the upper six inches of soil. Three inches of the limed soil should then be removed from the bed until the potatoes are placed and then used in covering them.

For light sandy soils 6 tons per acre will usually be sufficient, but for clay soils or loamy soils containing considerable humus 8 tons will give better results.

In case fertilization is necessary, mineral fertilizers should be used. No cotton seed meal or other organic fertilizer should be applied where bed rot is prevalent.